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NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 03/03/2004

Patent Counsel
TRW Inc.
S&E Law department, E2/6051
One Space Park
Redondo Beach, CA 90278

EXAMINER

RODRIGUEZ, ARMANDO

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 03/03/2004

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,765	06/21/2001	Dale L. Hook	ii-ii68	5915

TITLE OF INVENTION: HIGH ENERGY DF CHEMICAL LASER GAIN GENERATOR AND RELATED METHOD FOR ITS FABRICATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$300	\$1630	06/03/2004

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.
- B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY is shown as NO:

- A. Pay TOTAL FEE(S) DUE shown above, or
- B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.
 - ☐ Applicant claims SMALL ENTITY status.
See 37 CFR 1.27.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail

**Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
(703) 746-4000**

or Fax

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

7590 03/03/2004

Patent Counsel
TRW Inc.
S&E Law department, E2/6051
One Space Park
Redondo Beach, CA 90278

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/886,765	06/21/2001	Dale L. Hook	11-1168	5915
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TITLE OF INVENTION: HIGH ENERGY DF CHEMICAL LASER GAIN GENERATOR AND RELATED METHOD FOR ITS FABRICATION

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nonprovisional	NO	\$1330	\$300	\$1630	06/03/2004
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EXAMINER	ART UNIT	CLASS-SUBCLASS
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RODRIGUEZ, ARMANDO	2828	372-089000
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1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent); ☐ individual ☐ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:

- ☐ Issue Fee
- ☐ Publication Fee
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

Director for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature) _____ (Date) _____

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Alexandria, Virginia 22313-1450.**

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7590 03/03/2004

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Redondo Beach, CA 90278

EXAMINER

RODRIGUEZ, ARMANDO

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 03/03/2004

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 75 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 75 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

Notice of Allowability

Application No.

09/886,765

Examiner

Armando Rodriguez

Applicant(s)

HOOK ET AL.

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed January 6, 2004.
2. ☒ The allowed claim(s) is/are 1-6.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☒ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Paul IP
PAUL IP

ADVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

DETAILED ACTION

Drawings

Applicant's proposed drawings have not been received, however applicant is advised to submit formal with the appropriate corrections as requested by the Notice of Draftperson's Patent Drawing Review (PTO 948).

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Applicant's response to restriction requirement filed January 9, 2003, which elects claims 1-6 without traverse authorizes examiner to cancel nonelected claims 7-9. See MPEP 821.02.

Cancel nonelected claims 7-9.

The following is an examiner's statement of reasons for allowance:

After reviewing applicant's amendment, arguments and conducting an updated search none of the cited prior arts alone or in combination discloses the claimed chemical laser gain generator having the recited structural combination, where the gain generator structure uses platelet technology which allows for low metal temperatures and low gas inlet pressures.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is 571-272-1952. The examiner can normally be reached on 10-hour day / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on 571-272-1941. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Armando Rodriguez
Examiner
Art Unit 2828


Paul Ip
Supervisor
Art Unit 2828

AR/PI



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
09/886,765			

EXAMINER	
ART UNIT	PAPER NUMBER
2828	2004020

DATE MAILED:

EXAMINER INTERVIEW SUMMARY RECORD

All participants (applicant, applicant's representative, PTO personnel):

(1) Armando Rodriguez (3) _____
(2) Hook et al (4) _____

Date of interview 1/9/2003

Type: ☐ Telephonic ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description: _____

Agreement ☒ was reached with respect to some or all of the claims in question. ☐ was not reached.

Claims discussed: 7-9

Identification of prior art discussed: NA

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: Claims 7-9 are non-elected claims cancelled by Examiner's Amendment. MPER 821.02.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

Unless the paragraphs below have been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

☐ Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action.

PAUL IP

EXAMINER'S SIGNATURE
PAUL IP

Form PTO-948 (Rev. 03/03)
Application No. 09/886,765

U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

The drawing(s) filed (insert date) 06/10/03 are:

- A. ☐ approved by the Draftsperson under 37 CFR 1.84 or 1.152.
B. ☒ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated below. Corrected drawings are required.

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink or Color (3 sets required).
___ Color drawings are not acceptable until petition is granted. Fig(s) ___
___ Pencil and non black ink not permitted. Fig(s) ___

2. PHOTOGRAPHS. 37 CFR 1.84(b):
___ 1 full-tone set is required. Fig(s) ___
___ Photographs may not be mounted. 37 CFR 1.84(c)
___ Photographs must meet paper size requirements of 37 CFR 1.84(f). Fig(s) ___
___ Poor quality (half-tone). Fig(s) ___

3. TYPE OF PAPER. 37 CFR 1.84(e)
___ Paper not flexible, strong, white, and durable.
___ Fig(s) ___
☒ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted.
Fig(s) 1-3

4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:
21.0 cm by 29.7 cm (DIN size A4) or
21.6cm by 27.9cm (8 1/2x 11 inches)
___ All drawing sheets not the same size.
Sheet(s) ___
___ Drawing sheets not an acceptable size. Fig(s) ___

5. MARGINS. 37 CFR 1.84(g): Acceptable margins:
Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
___ Margins not acceptable. Fig(s) ___
___ Top (T) ___ Left (L) ___
___ Right (R) ___ Bottom (B) ___

6. VIEWS. 37 CFR 1.84(h)
REMINDER: Specification may require revision to correspond to drawing changes, e.g., if Fig. 1 is changed to Fig. 1A, Fig. 1B and Fig. 1C, etc., the specification, at the Brief Description of the Drawings, must likewise be changed.
___ Views not labeled separately or properly.
Fig(s) ___

7. SECTIONAL VIEWS. 37 CFR 1.84(h)(3)
___ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) ___

8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)
___ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) ___

9. SCALE. 37 CFR 1.84(k)
___ Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction.
Fig(s) ___

10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l)
☒ Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s) 1-3

11. SHADING. 37 CFR 1.84(m)
___ Solid black areas pale. Fig(s) ___
___ Solid black shading not permitted. Fig(s) ___

12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p)
___ Numbers and reference characters not plain and legible. Fig(s) ___
___ Figure legends are poor. Fig(s) ___
___ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s) ___
___ English alphabet not used. 37 CFR 1.84(p)(2) Fig(s) ___

___ Numbers, letters and reference characters must be at least 32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3). Fig(s) ___

13. LEAD LINES. 37 CFR 1.84(q)
___ Lead lines missing. Fig(s) ___

14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t)
___ Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s) ___

15. NUMBERING OF VIEWS. 37 CFR 1.84(u)
___ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) ___

16. DESIGN DRAWINGS. 37 CFR 1.152
___ Surface shading shown not appropriate.
Fig(s) ___
___ Solid black surface shading is not permitted except when used to represent the color black as well as color contrast. Fig(s) ___

COMMENTS:

Reviewer LAM
If you have questions, call (703) 305-8404.

Date 03/16/03
Attachment to Paper No. _____

BEST AVAILABLE COPY

BEST AVAILABLE COPY

Attachment for PTO-948 (Rev. 03/01, or earlier)
6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities – 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in **ABANDONMENT** of the application.

Appln. No. 09/886,765

Docket No. 11-1168

AMENDMENTS TO THE CLAIMS

1 (Currently Amended): A high energy DF chemical laser gain generator, comprising:

a combustor for generating atomic fluorine (F), including a plurality of combustor injectors, for injecting into the combustor a gas containing fluorine and hydrocarbon fuel;

a laser cavity in which lasing takes place as a result of a chemical reaction between the atomic fluorine (F) and deuterium (D₂); and

a plurality of laser cavity injector blades, for injecting deuterium (D₂) with the atomic fluorine into the laser cavity;

wherein the laser cavity injector blades include internal passages for flow of gas and internal passages for flow of cooling water;

and wherein the gain generator is formed from a plurality of uniformly thin, flat platelets of metal, each of which defines a cross-sectional slice of the gain generator, including the injector blades, and in which the internal passages for flow of cooling water and gas are formed by chemical etching of each platelet separately, to define cross-sectional elements of the internal passages;

whereby the water-cooled laser gain generator operates at relatively low temperatures and avoids the need for high gas inlet pressures.

2 (Original): A high energy DF chemical laser gain generator as defined in claim 1, wherein all of the platelets forming the laser gain generator are of a high strength alloy having sufficient strength to avoid the need for supporting structures within the gain generator.

Appln. No. 09/886,765

Docket No. 11-1168

3 (Original): A high energy DF chemical laser gain generator as defined in claim 2, wherein the high strength alloy is selected from the group consisting of Inconel 718 alloy, Inco 600, Haynes alloy L605, and Waspaloy.

4 (Currently Amended): A high energy HF chemical laser gain generator, comprising:

a combustor for generating atomic fluorine (F), including a plurality of combustor injectors, for injecting into the combustor a gas containing fluorine and deuterium (D₂);

a laser cavity in which lasing takes place as a result of a chemical reaction between the atomic fluorine (F) and deuterium (D₂); and

a plurality of laser cavity injector blades, for injecting deuterium (D₂) or H₂ with the atomic fluorine into the laser cavity;

wherein the laser cavity injector blades include internal passages for flow of gas and internal passages for flow of cooling water;

and wherein the gain generator is formed from a plurality of uniformly thin, flat platelets of metal, each of which defines a cross-sectional slice of the gain generator, including the injector blades, and in which the internal passages for flow of cooling water and gas are formed by chemical etching of each platelet separately, to define cross-sectional elements of the internal passages;

whereby the water-cooled laser gain generator operates at relatively low and uniform temperatures and avoids the need for high gas inlet pressures.

5 (Original): A high energy HF chemical laser gain generator as defined in claim 4, wherein all of the platelets forming the laser gain generator are of a high strength

Appln. No. 09/886,765

Docket No. 11-1168

alloy having sufficient strength to avoid the need for supporting structures within the gain generator.

6 (Original): A high energy HF chemical laser gain generator as defined in claim 5, wherein the high strength alloy is selected from the group consisting of Inconel 718 alloy, Inco 600, Haynes allow L605, and Waspaloy.

7 (Withdrawn): A method for fabricating a high energy DF or HF chemical laser gain generator, comprising the steps of:

separately etching each of a plurality of thin metal platelets, to define successive cross sections of a laser gain generator that includes a plurality of laser cavity injector blades with gas passages for the injection of fluorine and deuterium gases, and water passages for the flow of cooling water;

stacking the etched metal platelets in alignment to form the laser gain generator; and

applying heat and pressure to the stacked metal platelets, to fuse them together by diffusion bonding;

whereby the water cooling passages permit the laser gain generator to be operated at a relatively low and uniform temperature.

8 (Withdrawn): A method as defined in claim 7, wherein the metal platelets are of a high-strength nickel alloy.

9 (Withdrawn): A method as defined in claim 7, wherein the step of separately etching includes forming cross-sectional slices of a plurality of water cooling passages within each of a plurality of cavity injector blades in the laser gain generator.

Appln. No. 09/886,765

Docket No. 11-1168

REMARKS

In the aforementioned Office action, claims 1 and 4 were rejected under 35 U.S.C. §102(b) as allegedly anticipated by Warren, Jr. et al. (US 4,650,416), and claims 1-6 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Warren in view of Huniu et al. (US 4,453,914). By this amendment, the claims have been further amended to distinguish more clearly over the cited art and are submitted for reconsideration and re-examination in view of the following remarks.

As a preliminary matter, Applicant notes that the prior Office action (dated January 29, 2003) contained a rejection under 35 U.S.C. §112, second paragraph, and an objection to the drawings under 37 C.F.R. §1.83(a). Since these issues were not mentioned in the current Office action, Applicant assumes that they were satisfactorily resolved by Applicant's response dated June 10, 2003, and that the rejection and objections have been withdrawn. More specifically with regard to the drawing objections, Applicant proposed a number of minor changes to the drawings, and respectfully requests the Examiner's approval of these changes prior to submission of replacement drawings in response to the Notice of Draftsperson's Patent Drawing Review (PTO-948), which notes a number of drawing informalities.


As mentioned above, claims 1 and 4 were rejected as allegedly anticipated by the Warren patent. In support of the rejection, the Examiner attached a copy of Fig. 3 of the Warren patent and appended the following comment:

"Figure 3 illustrates an array of injector rings for a gain generator combustor having within the injector coolant channels (32) where water flows for cooling, diluent channels (34) where He flows, oxidizer channels (36) where NF_3 flows and fuel channels (38) where D_2 flows, as described in the abstract and column 8 lines 3-38."

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Claim 1, as previously amended, recites that "the gain generator is formed from a plurality of thin platelets of metal, each of which defines a cross-sectional slice of the gain generator, including injector blades, and in which the internal passages for flow of cooling water and gas are formed by chemical etching of each platelet separately"

The Examiner's comment points out only that the array of injector rings contains coolant channels, diluent channels, oxidizer channels and fuel channels. The comment does not identify where in the Warren patent one can find a description or suggestion of the present invention's use of a plurality of thin platelets to define the internal passages of the gain generator. The cylindrical gain generator disclosed by Warren is formed as an array of rings (14), each of which contains annular passages and channels, as referred to by the Examiner. There is no discussion in the patent concerning how these passages are formed in each ring. The abstract simply refers to "a plurality of primary rings having fuel, oxidizer and diluent orifices therein." Similarly, the referenced text in column 8 describes the geometry of the various passages and orifices but makes no suggestion as to how they might be formed. Presumably, one or more of the complex fabrication processes mentioned in paragraph [0003] of Applicant's specification might have been used. In any event, there is no disclosure or suggestion in Warren that the passages and orifices are formed using platelet technology. 

Another possible interpretation of the rejection based on Warren is that the Examiner intended to imply, without specifically so arguing, that the array of rings (14) of Warren are structurally equivalent to the thin platelets of present invention. The rings (14) are stacked together to form a combustor for a cylindrical laser, but such an arrangement in no way suggests the use of platelet technology to fabricate a chemical

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laser gain generator. First, the rings shown in Fig. 3 of Warren are not thin platelets of metal, each of which defines a cross-sectional slice of the gain generator. The Warren rings are, by no stretch of the imagination, flat, uniformly thin platelets, and individually they do not define a cross-sectional slice of the gain generator.

Yet another possible interpretation of the rejection based on Warren is that the Examiner intended to imply, without specifically so arguing, that the cylindrical structure disclosed by Warren is fabricated using platelet slices corresponding to the illustration of Fig. 3. There is, however, no support in the Warren patent for this implication. The fact that Fig. 3 is itself a cross-sectional view is no way supportive of any argument to the effect that Warren teaches fabrication of a combustor using platelet technology. Cross-sectional views are, of course, widely used to illustrate features of mechanical structures that would otherwise be hidden from view if only external views were used. However, unless such a view is specifically described as pertaining to a physical cross-sectional slice of that structure, one cannot reasonably infer that the structure is fabricated using slices of material corresponding to the cross-sectional view. Such a description of Fig. 3 is lacking in the Warren patent. In fact, as mentioned earlier, no specific method of fabrication of the Warren structure is disclosed or suggested in the patent.

Accordingly, the rejection of claim 1 as anticipated by Warren is believed to be without a proper basis, and reconsideration and withdrawal of the rejection are respectfully requested. The same comments apply to the rejection of claim 4 as unpatentable over Warren. Claims 1 and 4 have been further amended to emphasize the nature of the thin platelets used in the present invention and to distinguish them

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from the rings (14) in Warren. In particular, the platelets are uniformly thin and flat, unlike the rings of Warren. Also unlike the rings of Warren, the platelets in the present invention define cross-sectional elements of the internal passages through the structure that the platelets collectively form.

Claims 1-6 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Warren in view Huniu et al.

Regarding claims 1 and 4, the Examiner appended the same comment that was used in making the Section 102 rejection. For the same reasons that claims 1 and 4 are believed to be not anticipated by Warren, the claims are also believed to be not rendered obvious by Warren. As discussed above, the rings (14) of Warren are in no way equivalent to or suggestive of the platelets of the present invention. Moreover, there is no disclosure or suggestion in Warren that platelet technology is used to fabricate the disclosed structure. Therefore, reconsideration and withdrawal of this ground of rejection are respectfully requested.

Regarding claims 2, 3, 5 and 6, the Examiner points out that the Huniu patent discloses well known materials for making gas injectors of gain generators, including inconel, nickel, stainless steel and copper. Applicant concedes that, if independent claims 1 and 4 were not patentable, the specific choice of platelet materials would probably not amount to a patentable invention. However, it is Applicant's contention that claims 1 and 4 do define patentable subject matter, as discussed above, and that claims 2, 3, 5 and 6 should, therefore, also be allowable as dependent claims.

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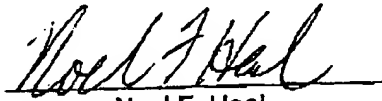
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In view of the foregoing, reconsideration and withdrawal of the rejections are respectfully requested, along with formal indication of allowability claims 1-6.

Respectfully submitted,

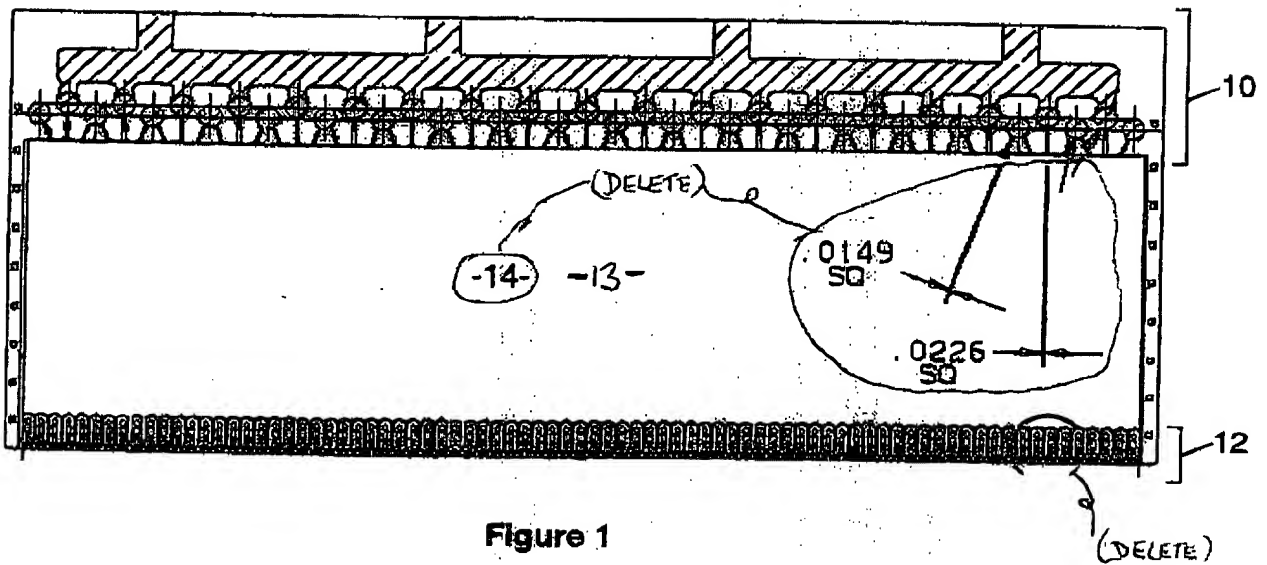
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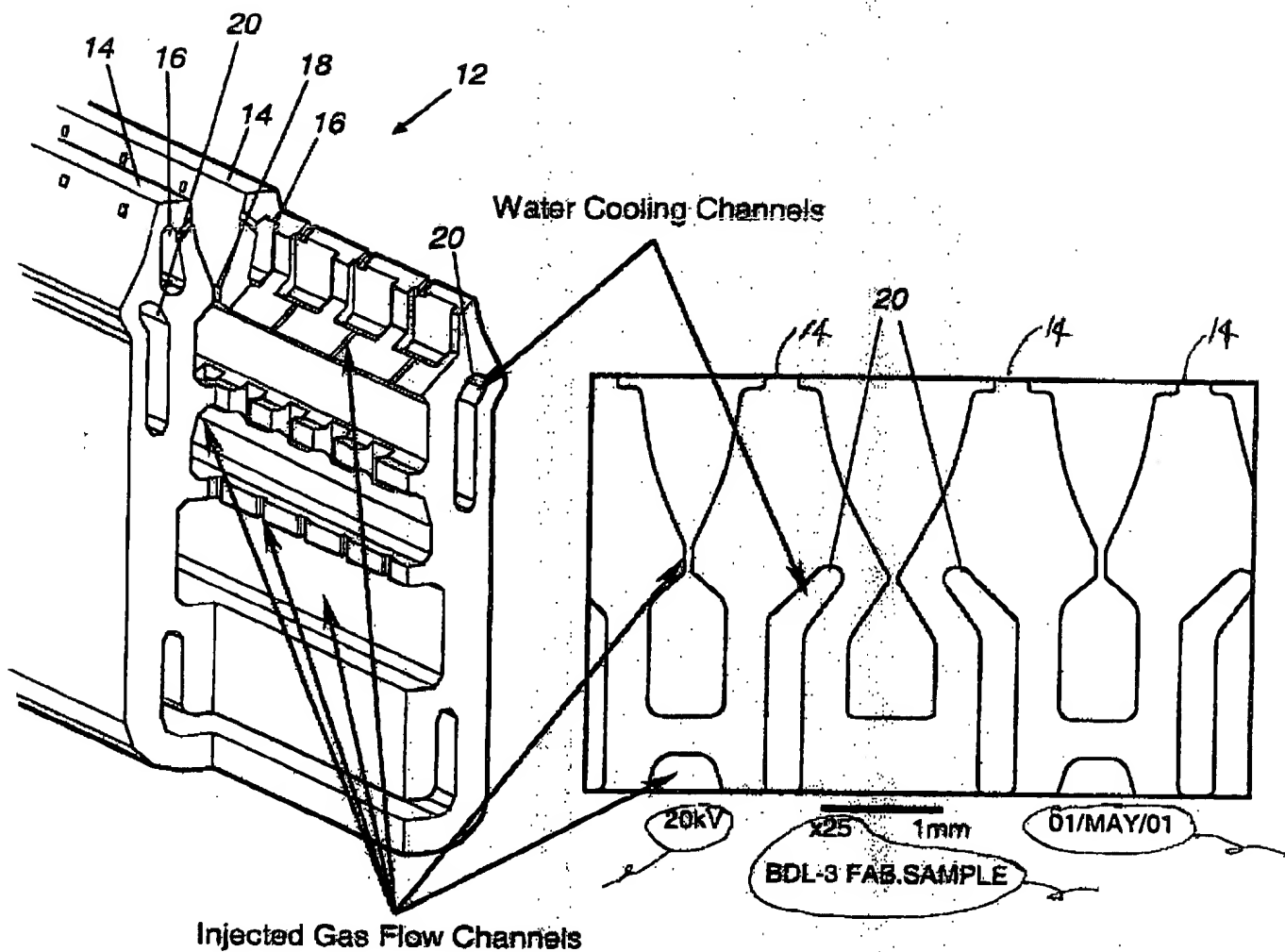


Figure 2

Figure 3